

Remarks

Claims 3, 5-8, and 11 have been canceled. Claims 1-2, 4, 9-10, and 12-15 remain.

The Section 112 rejection has been overcome by deletion of the term “substantially” in claims 9-10, as suggested by the Examiner.

Claims 1, 4-7, 10-12, and 15 have been rejected under Section 102(b) as being anticipated by Simion et al. (US 6185081). Simion has been interpreted as disclosing “a magnetic sensor structure having multiple layers of Cr or CrV corresponding to the claimed underlayers alternating with multiple layers of a material such as MgO or NiAl”. In Simion, the MgO layer functions as a seed layer for the Co hard magnetic material because of its B1 crystallographic structure, as described by Fig. 4 and col. 3, lines 25-37.

Claim 1 has been amended to include the limitations of former claim 8, i.e., that the interlayer between the two underlayers is “an oxide selected from the group consisting of oxides of aluminum, oxides of tantalum, oxides of silicon and oxides of hafnium.” Thus Simion is not an anticipating reference for amended claim 1 or any of its dependent claims, and this Section 102(b) rejection should be withdrawn.

Simion has also been cited under Section 103(a) to reject claims 2-3. However, in view of the amendment to claim 1, this rejection of dependent claim 2 should be withdrawn. Also, the teaching by Simion of MgO as a seed layer because of its unique crystalline structure that lattice-matches that of the Co hard magnetic layer is not related to and does not suggest the specific oxide interlayers claimed in Applicant’s amended claim 1. In Applicant’s invention the Co hard magnetic layer is not formed directly on the oxide layer, but is formed on the Cr or Cr-alloy underlayer.

Claims 1, 7-8, and 11-15 have been rejected under Section 102(c) as being anticipated by Pinarbasi et al. (US 200310058586) for the reason that “Figure 4 shows a TaO layer (482) corresponding to the first interlayer, a gap layer (423) corresponding to the first underlayer, and a Cr layer (484) corresponding to the claimed second underlayer.”

Pinarbasi does not show the structure as now claimed in Applicant's amended claim 1. In particular the first underlayer in Applicant's invention is formed of a material "selected from the group consisting of Cr, Cr_xMo_{1-x}, Cr_xMn_{1-x}, Cr_xTi_{1-x} and Cr_xV_{1-x}". Pinarbasi does not show that the "gap layer (423)" is formed of this material, and in fact the read gap can not be formed of such a material. Thus, in view of the amendment to claim 1, this Section 102(e) rejection should be withdrawn

Claims 1-2, 4, and 9-10 have been rejected under Section 102(e) as being anticipated by Wu et al. (US 20061005 1623) for the reason that Wu et al. discloses "a structure including multiple seed layers and underlayers corresponding to the claimed underlayers and interlayers disposed beneath a hard magnetic layer (see Fig 2)."

Wu relates to a magnetic recording disk, not to a seed layer structure for a "hard magnetic material for providing longitudinal biasing to a ferromagnetic layer in a magnetic sensor." In addition, the composition of the layers as now claimed in Applicant's amended claim 1 are not shown in Wu. More specifically, Wu does not teach oxide interlayers. Thus, in view of the amendment to claim 1, this Section 102(e) rejection should be withdrawn.

Wu has also been cited under Section 103(a) to reject claim 5. However, in view of the amendment to claim 1, which now includes the limitation of former claim 5, and for the reasons stated above, this Section 103(a) rejection should be withdrawn.

All remaining claims are now believed to be in condition for allowance. The Examiner is invited to call Applicants' attorney if a telephone conference will expedite the prosecution of this application.

Respectfully submitted,

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